

Appl. No. 10/048,040
 Amendment and/or Response
 Reply to Office Action of May 16, 2005

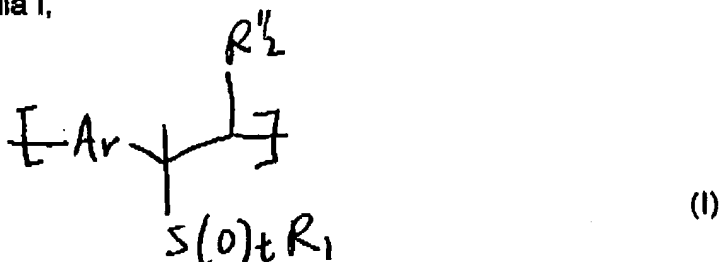
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Amendments to the Claims:

A listing of the entire set of pending claims (including amendments to the claims, if any) is submitted herewith per 37 CFR 1.121. This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

1. (Previously Presented) A method of preparing a polymer which comprises structural units of formula I,



in which formula:

- Ar** is an aromatic cyclic system with 4 to 20 carbon atoms, which may be substituted with a substituent chosen from the group consisting of a non-branched C₁-C₂₀-alkyl, a C₃-C₂₀-alkoxy, a C₁-C₂₀-alkylsulfate, a branched C₃-C₂₀-alkyl, a phenyl group and a benzyl group and which may comprise up to 4 heteroatoms chosen from the group consisting of oxygen, sulfur and nitrogen in the aromatic cyclic system,
- t** is equal to 0, 1 or 2,
- R₁** is chosen from the group consisting of a non-branched C₁-C₂₀-alkyl group, a branched C₃-C₂₀ alkyl group, a cyclic C₄-C₂₀-alkyl group, a C₁-C₄-alkyl-substituted cyclic C₄-C₂₀-alkyl group, a phenyl group and a benzyl group, which groups may comprise heteroatoms,
- R₂ and R'₂** are each chosen for the group consisting of a hydrogen atom, a C₁-C₂₀-alkyl group, and a C₄-C₂₀-aryl group, which groups may comprise substituents, characterized in that the method starts with a compound having the formula II

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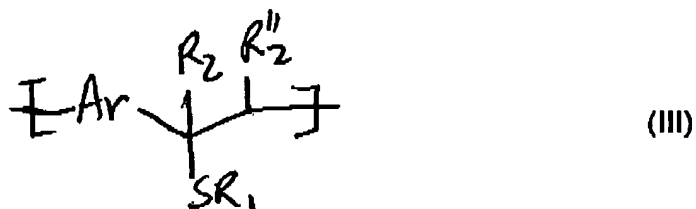
in which formula

R_1' is chosen from the group consisting of a non-branched C_1 - C_{20} -alkyl group, a branched C_3 - C_{20} -alkyl group, a cyclic alkyl group, a C_1 - C_4 -alkyl-substituted cyclic alkyl group, a phenyl group, and a benzyl group, which groups may comprise heteroatoms,

R_1 , R_2 and Ar are equal to R_1 , R_2 and Ar in formula I, and

R_2' is chosen from the group consisting of a hydrogen atom, a C_1 - C_{20} -alkyl group, an a C_6 - C_{20} -aryl group, which groups may comprise substituents,

and that the polymer with structural units of the formula I is prepared through polymerization with the aid of a base into a polymer which comprises units having the formula III



in which formula

R_1 , R_2 and Ar are equal to R_1 , R_2 and Ar in formula II, and

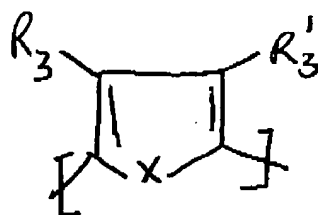
R_2'' is chosen from the group comprising R_2 and R_2' ,

and for the preparation of the polymer with units having the formula I, in which formula t is equal to 1 or 2, through oxidation of at least a number of the units of the polymer having the formula III.

2. (Previously Presented) A method as claimed in claim 1, characterized in that the method starts with a compound having the formula II in which $-Ar-$ is the unit having the formula IV

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(IV)

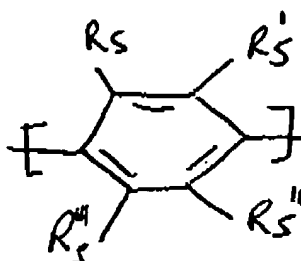
in which formula

X is chosen from the group consisting of O, S, NR₆,

R₂ and R'₃ are chosen from the group consisting of a hydrogen atom, a chlorine atom, a bromine atom, a fluorine atom, and an iodine atom, a C₁-C₄-alkyl group, a carbonitril group, a trihalomethyl group, a hydroxy group, a nitro group, an amino group, a carboxyl group, a sulfoxyl group, a sulfonate group, a carbonate group, a substituted and non-substituted phenyl group, an alkylaryl group, an alkalkyl group, an alkoxy group, and a thioalkoxy group, and

R₆ is chosen from the group consisting of a hydrogen atom, a C₁-C₂₀-alkyl group, an aryl group, a C₁-C₂₀-alkylaryl group and an arylalkyl group.

3. (Previously Presented) A method as claimed in claim 1, characterized in that the method starts with a compound having the formula II in which -Ar- is the unit having the formula V



(V)

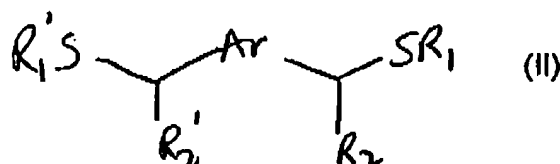
in which formula

R₅, R'₅, R''₅ and R'''₅ are chosen from the group consisting of a hydrogen atom, a chlorine atom, a bromine atom, a fluorine atom, an iodine atom, a C₁-C₂₂-alkyl group, a carbonitril group, a trihalomethyl group, a hydroxy group, a nitro group, an amino group, a carboxyl group, a sulfoxyl group, a sulfonate group, a carbonitrate group, an optionally substituted phenyl group, a C₁-C₂₂-alkylaryl group, a C₁-C₂₂-arylalkyl group, a C₁-C₂₂-alkoxy group, and a C₁-C₂₂-thioalkoxy group.

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4. (Withdrawn) A method of preparing compounds having the formula II in which formula

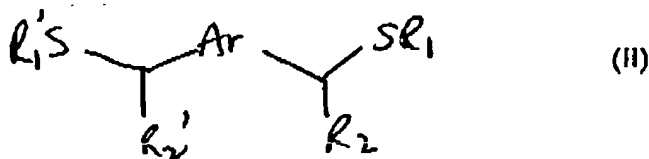


Ar is an aromatic cyclic system with 4 to 20 carbon atoms, which may be substituted with a substituent chosen from the group comprising a non-branched C₁-C₂₀-alkyl, C₃-C₂₀-alkoxy, C₁-C₂₀-alkylsulfate, a branched C₃-C₂₀-alkyl, phenyl or benzyl group and which may comprise up to 4 heteroatoms chosen from the group comprising oxygen, sulfur, and nitrogen in the aromatic cyclic system,

R₁ and R₁' are chosen from the group comprising a non-branched C₁-C₂₀-alkyl group, a branched C₃-C₂₀ alkyl group, a cyclic alkyl group, a C₁-C₄-alkyl-substituted cyclic alkyl group, a C₄-C₁₄-aryl group, and a benzyl group, which groups may comprise heteroatoms,

R₂ and R₂' are chosen from the group comprising a hydrogen atom and C₁-C₂₀-alkyl and a C₄-C₂₀-aryl group, which groups may comprise substituents, characterized in the H-Ar-H reacts with R₁SH and R₂(C=O)-H and with R₁'SH and R₂'-(C=O)-H so as to form the compound having the formula II.

5 (Withdrawn) Compounds having the formula II



in which formula:

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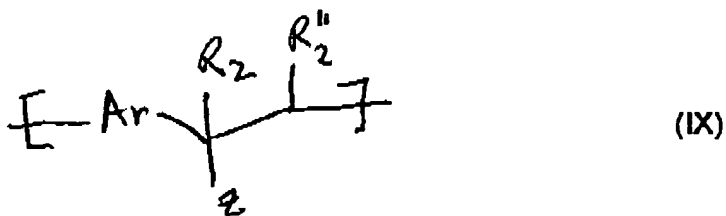
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- Ar** is an aromatic cyclic system with 4 to 20 carbon atoms, which may be substituted with a substituent chosen from the group comprising a non-branched C₁-C₂₀-alkyl, C₃-C₂₀-alkoxy, C₁-C₂₀-alkylsulfate, a branched C₃-C₂₀-alkyl, phenyl or benzyl group and which may comprise up to 4 heteroatoms chosen from the group comprising oxygen, sulfur, and nitrogen in the aromatic cyclic system,
- R₁ and R'₁** are chosen from the group comprising a non-branched C₁-C₂₀-alkyl group, a branched C₃-C₂₀ alkyl group, a cyclic alkyl group, a C₁-C₄-alkyl-substituted cyclic alkyl group, a C₄-C₁₄-aryl group, and a benzyl group, which groups may comprise heteroatoms,
- R₂** is chosen from the group comprising a C₁-C₂₀-alkyl and C₄-C₂₀-aryl group, which groups may comprise substituents, and
- R'₂** is chosen from the group comprising a hydrogen atom, a C₁-C₂₀-alkyl and a C₄-C₂₀-aryl group, which groups may contain substituents.

6. (Cancelled)

7. (Cancelled)

8. (Currently Amended) A composition of polymers with structural units having the formula IX:



- Ar** is an aromatic cyclic system with 4 to 20 carbon atoms, which may be substituted with a substituent chosen from the group consisting of a non-branched C₁-C₂₀-alkyl, group, a C₃-C₂₀-alkoxy group, a C₁-C₂₀-alkylsulfate group, a branched C₃-C₂₀-alkyl group, a phenyl group and a benzyl group and which may comprise up to 4 heteroatoms chosen

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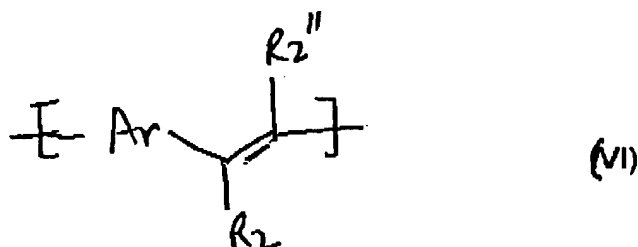
from the group consisting of oxygen, sulfur and nitrogen in the aromatic cyclic system,

R_2 and R_2' are chosen from the group comprising consisting of a hydrogen atom and C_1 - C_{20} -alkyl and a C_4 - C_{20} -aryl group, which groups may comprise substituents, and

Z is chosen from a group consisting of $S(O)_pR_1$, OR_2 , in which p is equal to 0, 1 or 2, and R_1 and R_2 are chosen from the group comprising a non-branched C_1 - C_{20} -alkyl group, a branched C_3 - C_{20} alkyl group, a cyclic C_4 - C_{20} alkyl group, a C_1 - C_4 -alkyl-substituted cyclic C_4 - C_{20} -alkyl group, a phenyl group, and a benzyl group, which groups may contain heteroatoms,

wherein a first fraction of the composition comprises polymers with structural units having the formula IX with Z equal to $S(O)_pR_1$ and a chain length of 50 to 1000 units, and a second fraction of the composition comprises polymers with a chain length of more than 1000 units.

9. (Withdrawn) A method of preparing a polymer with structural units having the formula VI,



In which formula:

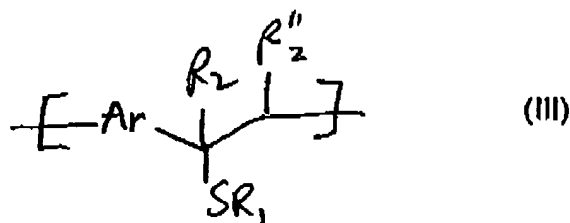
Ar is an aromatic cyclic system with 4 to 20 carbon atoms, which may be substituted with a substituent chosen from the group consisting of a non-branched C_1 - C_{20} -alkyl, group, a C_3 - C_{20} -alkoxy group, a C_1 - C_{20} -alkylsulfate group, a branched C_3 - C_{20} -alkyl group, a phenyl group and a benzyl group and which may comprise up to 4 heteroatoms chosen

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from the group consisting of oxygen, sulfur and nitrogen in the aromatic cyclic system,

R_2 and R'_2 are chosen from the group comprising a hydrogen atom and C_1 - C_{20} -alkyl and C_4 - C_{20} -aryl group, which group may comprise substituents, wherein a polymer comprising structural units having the formula III is directly converted into the polymer comprising structural units of the formula IV by heating under catalysis of acid,

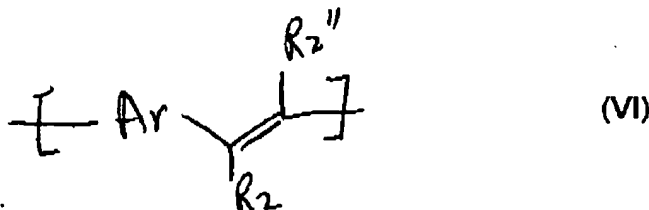


in which formula III

R_1 is chosen from the group comprising a non-branched C_1 - C_{20} -alkyl group, a branched C_3 - C_{20} alkyl group, a cyclic C_4 - C_{20} -alkyl group, a C_1 - C_4 -alkyl-substituted cyclic C_4 - C_{20} -alkyl group, a phenyl group and a benzyl group, which groups may comprise heteroatoms, and

Ar , R_2 and R'_2 are equal to Ar , R_2 and R'_2 in formula IV.

10. (Withdrawn) A method of manufacturing a layer of a polymer with structural units having the formula VI,



in which formula:

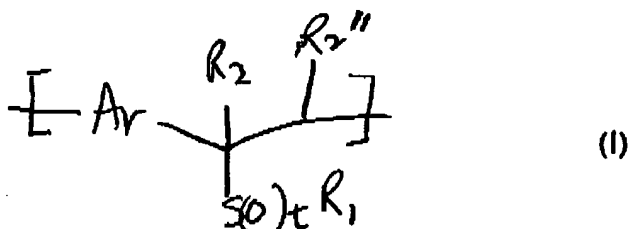
Ar is an aromatic cyclic system with 4 to 20 carbon atoms, which may be substituted with a substituent chosen from the group consisting of a non-branched C_1 - C_{20} -alkyl, group, a C_3 - C_{20} -alkoxy group, a C_1 - C_{20} -

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alkylsulfate group, a branched C₃-C₂₀-alkyl group, a phenyl group and a benzyl group and which may comprise up to 4 heteroatoms chosen from the group consisting of oxygen, sulfur and nitrogen in the aromatic cyclic system, and

R₂ and R₂' are chosen from the group comprising a hydrogen atom and C₁-C₂₀-alkyl and C₄-C₂₀-aryl group, which group may comprise substituents, which method comprises the application of a solution of the polymer comprising structural units having the formula I as a layer on a substrate,



in which formula I:

t is equal to 0, 1 or 2,

R₁ is chosen from the group comprising a non-branched C₁-C₂₀-alkyl group, a branched C₃-C₂₀ alkyl group, a cyclic C₄-C₂₀-alkyl group, a C₁-C₄-alkyl-substituted cyclic C₄-C₂₀-alkyl group, a phenyl group, and a benzyl group, which groups may comprise heteroatoms, and

R₂, R₂', and Ar are equal to R₂, R₂' and Ar respectively, in formula IV, and the conversion through beating of the polymer comprising structural units of the formula VI into the polymer comprising structural units of the formula VI, characterized in that the solution to be provided as a layer comprises a polymer with structural units having the formula I, with a chain length of at least 50 and at most 1000 units.

11. (Withdrawn) A method as claimed in claim 10, characterized in that the solution to be provided as a layer also comprises a polymer with structural units having the formula I, with a chain length of at least 50 and at most 1000 units.

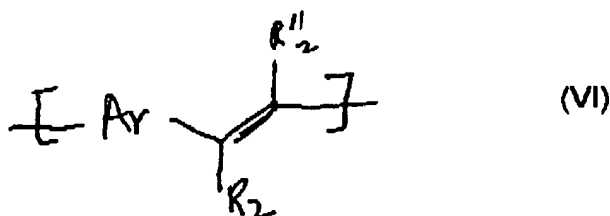
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12. (Withdrawn) A method as claimed in claim 10, characterized in that the method starts with a solution of a polymer which structural units having the formula I, in which p is equal to 0, and the polymer with structural units having the formula I, in which p is equal to 0, is oxidized with a peroxide prior to the application of the solution as a layer, such that the polymer with structural units having the formula I is created in which p is equal to 1 in at least a proportion of the units.

13. (Withdrawn) A method as claimed in claim 10, characterized in that the solution applied as the layer on the substrate contains the polymer with structural units having the formula I, in which p is equal to 0, and the conversion through heating is catalyzed by acid.

14. (Withdrawn) An electronic device comprising a layer of a polymer with mainly the structural units having the formula VI:



in which formula:

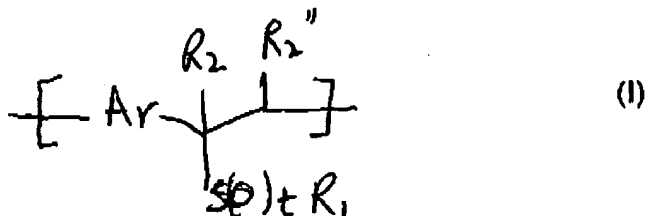
Ar is an aromatic cyclic system with 4 to 20 carbon atoms, which may be substituted with a substituent chosen from the group consisting of a non-branched C₁-C₂₀-alkyl group, a C₃-C₂₀-alkoxy group, a C₁-C₂₀-alkylsulfate group, a branched C₃-C₂₀-alkyl group, a phenyl group and a benzyl group and which may comprise up to 4 heteroatoms chosen from the group consisting of oxygen, sulfur and nitrogen in the aromatic cyclic system,

R₂ and R'₂ are chosen from the group comprising a hydrogen atom and C₁-C₂₀-alkyl and C₄-C₂₀-aryl group, which group may comprise substituents,

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characterized in that the polymer is prepared from at least a polymer with structural units having the formula I, with a chain length of at least 50 and at most 1000 units,



t is equal to 0, 1 or 2

R_1 is chosen from the group comprising a non-branched C_1 - C_{20} -alkyl group, a branched C_3 - C_{20} -alkyl group, a cyclic C_4 - C_{20} -alkyl group, a C_1 - C_4 -alkyl-substituted cyclic C_4 - C_{20} -alkyl group, a phenyl group and a benzyl group, which groups may comprise heteroatoms, and

R_2 , R_2'' and Ar are identical to R_2 , R_2'' and Ar respectively, in formula VI.